PA[illegible]NT COOPERATION TREAT[illegible]

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark
Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 31 May 2001 (31.05.01)	
International application No. PCT/SG00/00122	**Applicant's or agent's file reference** TKL/P5409
International filing date (day/month/year) 23 August 2000 (23.08.00)	**Priority date** (day/month/year) 23 August 1999 (23.08.99)
Applicant SIO, Yeok, Sing	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

22 March 2001 (22.03.01)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer Olivia TEFY
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

Form PCT/IB/331 (July 1992)

SG0000122

14

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
TKL/P5409		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/SG00/00122	23/08/2000	23/08/1999
International Patent Classification (IPC) or national classification and IPC E05C19/06		
Applicant SIO, Yeok Sing		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 10 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
22/03/2001	23.11.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Landriscina, V Telephone No. +49 89 2399 7909

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/SG00/00122

I. Basis f th report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

1-11 as originally filed

Claims, No.:

1-27 as originally filed

Drawings, sheets:

1/7-7/7 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 21, 25-27.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 21, 25-27 are so unclear that no meaningful opinion could be formed (*specify*):
see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citati ns and explanati ns supp rting such statement

1. Statement

Novelty (N) Yes: Claims 7, 9, 11-20, 22

	No:	Claims	1-6, 8, 10, 23, 24
Inventive step (IS)	Yes:	Claims	16
	No:	Claims	7, 9, 11-15, 17-20, 22
Industrial applicability (IA)	Yes:	Claims	1-20, 22-24
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

R It m III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

a. Claim 21 does not meet the requirements of Article 6 PCT because it is not clear how the opposing sides of the first member are configured, since not any information has been provided in the claims regarding the members and since those members, as claim 1 reads, are actually not part of the matter for which protection is claimed.

b. Claims 25-27 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined.

These claims contain references to the description and the drawings. According to Rule 6.2(a) PCT, claims should not contain such references except where absolutely necessary, which is not the case here. As the drawings are schematic and vaguely indicative it is not possible to assume them as the basis for determining the features of the invention, which on the contrary should be explicitly indicated in the claims.

Because of these unclarities no meaningful opinion could be formed on claims 21 and 25-27.

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: US 4 725 084 A
D2: EP 0 508 750 A
D3: "Latch Mechanism Comprising Plastic parts" (H. Nomura), IBM TECHNICAL DISCLOSURE BULLETIN, vol. 26, no.4 (1983-09-01), pages 2041-2042, XP002152916, New York, US.

D4: US 3 160 431 A
D5: CH 649 602 A
D6: US 5 641 186 A

1. Indipendent claim 1

1.1 Document D1 discloses (cf. column 2, line 61 - column 4, line 37) a catch assembly from which the subject-matter of claim 1 does not differ.

D1 shows a catch assembly (fig.1-3, 16) for securing first (10) and second members (11), the assembly comprising first and second catch members (17, 18) attachable to the first and second members respectively, each catch member having a projection (17D, 18C) portion located on a shaft (17C, 18B). The projections of the first and second catch members are engageable with one another when the first and second catch members are in a locked position (fig. 3). The first and second shaft portions are flexible, such that as the members are moved apart or together when the catch members are in the locked position, the shafts flex to keep the projections engaged with one another (cf. column 3, lines 12 to 17 and lines 42 to 48).

The subject-matter of claim 1 is not new in respect of the prior art and therefore does not satisfy the criterion set forth in Article 33(2) PCT.

1.2 The subject-matter of claim 1 is not new also in respect of documents D2 (see fig. 1-3 and column 4, lines 30 to 43) and D3 (see fig. 1A).

2. Dependent claims 2-6, 8, 10, 23 and 24

Dependent claims 2-6, 8, 10, 23 and 24 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty, as the features of each above mentioned claim are known in combination from the same prior art document document (i.e. D1, D2 or D3).

To this regard it should be mentioned that values of the Young's modulus for many well known plastic materials and for a common carbon steel, as the materials described in the state of the art, are higher than 62 GN /m^2 or 103 GN /m^2 (for

instance Polypropylen: 1100-1300 GN /m^2).

3. **Dependent claims 7, 9 and 11**

Dependent claims 7, 9 and 11 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, as the same features relate to common non inventive design practice, as known for example from the documents cited in the search report.

4. **Dependent claims 12-15**

The subject-matter of claim 12 to 15, as far as it can be understood (see observations under item VIII), does not involve an inventive step and therefore does not satisfy the criterion set forth in Article 33(3) PCT.

Document D3, which is considered to represent the most relevant state of the art for these claims, discloses (cf. fig. 1A) a latch mechanism including a pair of catch members (1 and 2).

Document D4 shows a latch assembly for cabinets (fig.1 and 2) having three latching projections (fig. 3, 51, 51 and 51`) arranged with two opposite orientations along the edge of the cabinet door.

The subject-matter of claims 12-15 does not involve an inventive step because the skilled person, in order to achieve a higher level of latching security, would regard it as a normal design option to arrange the catch members described in document D3 according to the configuration shown in document D4, thus arriving to the claimed solutions.

5. **Dependent claims 17-19**

The subject-matter of claim 17, 18 and 19 does not involve an inventive step and therefore does not satisfy the criterion set forth in Article 33(3) PCT.

Document D3, which is considered to represent the most relevant state of the art for these claims, discloses (cf. fig. 1A) a latch mechanism including a pair of catch members (1 and 2) from which the subject-matter of claim 17 differs in that a lock

member is provided, configured to move the catch members into a locked position.

Document D5 shows a device (fig.1 and 2) including a locking system (Exzenter 3, Schaft 10, Schlitz 20) adapted to secure and hence move the elements (8) and (2) into a locked position.

The solution proposed in claim 17 does not involve an inventive step because the skilled person would regard it as a normal design option to combine the locking system of D5 with the catch members described in document D3 in order to bring them into a locked position.

Movement of the locking system of D5 (i.e. of the eccentric 3) clearly affects or causes movement of at least element (8) (see fig. 1 and 3). It also affects movement of the member (6) when locking it in the closed position. Therefore claims 18 and 19 lack an inventive step as well (Article 33(3) PCT).

6. **Dependent claims 20 and 22**

The subject-matter of claim 20 and 22 does not involve an inventive step and therefore does not satisfy the criterion set forth in Article 33(3) PCT.

Document D3, which is considered to represent the most relevant state of the art for these claims, discloses (cf. fig. 1A) a catch assembly from which the subject-matter of claim 20 differs in that such assembly is comprised in a sliding member assembly, beside two members one of which, at least, slides relative to the other.

Document D6 shows a couple of door panels (fig. 1, 32) that can slide relative to one another, provided with catch members which however do not show any shaft.

The skilled person would apply the catch assembly shown in D3 to the door panels (32) of D6 as an obvious constructional option without involving an inventive step. Therefore the subject-matter of claim 20 does not satisfy the criterion set forth in Article 33(3) PCT.

Also claim 22, consequently, lacks an inventive step (Article 33(3) PCT), since each panel shown in D6 (fig. 1, 32) can be regarded as a sliding door.

7. D p nd nt claim 16

Not any document cited in the International Search Report shows a catch assembly as disclosed in claim 16, as far as this claim can be understood (see observations under item VIII). The subject-matter of claim 16 is therefore novel (Article 33(2) PCT).

Document D4 discloses (cf. fig.1-3) a latch assembly for medicine cabinets, which comprises a plurality of latches with opposite orientations. However, these latches are different from the catch assembly according to claim 1, to which claim 16 refers. Furthermore, only one latch is opposite oriented and not all the catches are arranged alternatively with opposite orientations. Increasing the number of catches and arranging them alternatively with opposite orientations can make the catch assembly more difficult to be opened or disengaged.

The prior art documents, then, do not show all the features of claim 16 either alone or in combination. The subject-matter of claim 16 involves, then, an inventive step and therefore satisfies the criterion set forth in Article 33(3) PCT.

Re Item VII

Certain defects in the international application

a. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

b. Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
In the present case, as mentioned in section V under point 1, all the features of claim 1 are known in combination from the documents D1, D2 or D3.

c. Reference sign 117, which is used in the description on page 9, last paragraph, is not shown in figure 8.

Re Item VIII

Certain observations on the international application

Claims 12-16 do not meet the requirements of Article 6 PCT since they all refer to elements (catches) which have not been defined in any preceding claim. The preceding claims 1-11 define or introduce a catch assembly and first and second catch members, therefore it is not clear which elements have to be regarded as catches. For the purpose of establishing this report the term "catch" has been considered as referring to a catch assembly according to claim 1.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
TKL/CSC/P5409		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/SG 00/ 00122	23/08/2000	23/08/1999
Applicant		
SIO, Yeok Sing		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language,** the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 1

   [X] as suggested by the applicant.

   [ ] None of the figures.

   [ ] because th applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

INTERNATIONAL SEARCH REPORT

International Application No
PC[redacted] 00/00122

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 E05C19/06 E05B65/46 E06B5/11 E06B3/46

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 E05C E05B E06B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	H. NOMURA: "Latch Mechanism Comprising Plastic Parts" IBM TECHNICAL DISCLOSURE BULLETIN, vol. 26, no. 4, 1 September 1983 (1983-09-01), pages 2041-2042, XP002152916 New York, US	1,2,4-8, 10,11, 25,26
Y	the whole document	12-15, 17,18, 20,22

Y	US 3 160 431 A (RALPH F. ANDERSON; CHARLES G. HALLGREN) 8 December 1964 (1964-12-08)	12-15
A	figures 1-17	16,20, 22-24

	-/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 November 2000	30/11/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	PEREZ MENDEZ, J

2

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No
PC[redacted]00/00122

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
Y	CH 649 602 A (EGOKIEFER AG) 31 May 1985 (1985-05-31)	17,18
A	the whole document	1,4-11
Y	US 5 641 186 A (ROSS DAMIEN) 24 June 1997 (1997-06-24) figures 1-6	20,22
X	EP 0 508 750 A (THE KIDDY GROUP PLC) 14 October 1992 (1992-10-14) column 4, line 30 - line 43; figures 1-3	1,2,4-8, 23,34
X	US 4 725 084 A (FRANK CATRICOLA) 16 February 1988 (1988-02-16)	1-9, 23-25,27
A	column 2, line 61 -column 4, line 37; figures 1-3	12,13
A	DE 84 30 945 U (RITTER STARKSTROMTECHNIK GMBH & CO) 14 September 1989 (1989-09-14) page 4, paragraph 3 -page 5, paragraph 4; figures 1-5	12,13,19
A	FR 2 414 108 A (ROUTCHENKO MICHEL) 3 August 1979 (1979-08-03) figures 1-14	1,17,18, 20-23

2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PC[redacted] 00/00122

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 3160431	A	08-12-1964	NONE		
CH 649602	A	31-05-1985	NONE		
US 5641186	A	24-06-1997	CA	2134829 A,C	03-05-1995
EP 0508750	A	14-10-1992	GB	2254647 A	14-10-1992
US 4725084	A	16-02-1988	NONE		
DE 8430945	U	14-09-1989	NONE		
FR 2414108	A	03-08-1979	NONE		

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
1 March 2001 (01.03.2001)

PCT

(10) International Publication Number
WO 01/14672 A1

(51) International Patent Classification[7]: E05C 19/06, E05B 65/46, E06B 5/11, 3/46

(21) International Application Number: PCT/SG00/00122

(22) International Filing Date: 23 August 2000 (23.08.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
9904110-5 23 August 1999 (23.08.1999) SG

(71) Applicant and
(72) Inventor: SIO, Yeok, Sing [SG/SG]; 11 Kranji Way, Singapore 739426 (SG).

(74) Agent: K. L. TAN & ASSOCIATES; 144A Neil Road, Singapore 088873 (SG).

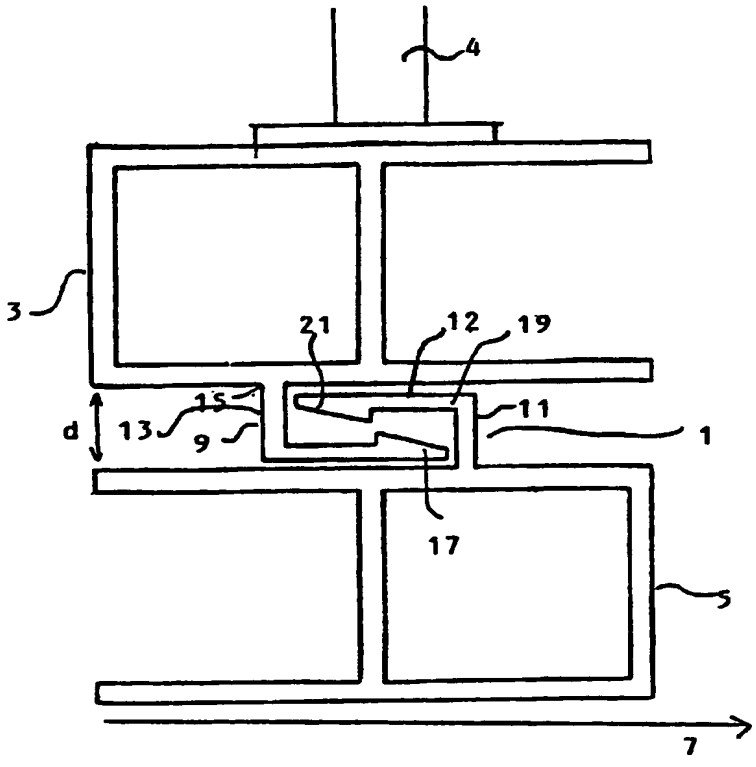
(81) Designated States *(national)*: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A CATCH



(57) Abstract: A catch for sliding or hinged doors, windows, grilles of a swing opening member such as a door, window etc. having a catch for preventing unauthorised opening of the door etc. The catch has inter-engaging projections which are mounted on flexible shafts, if the sliding members are prised apart, the flexible shafts deform such that the projections keep engaged and prevent unauthorised opening of the sliding members.

WO 01/14672 A1

A Catch

The present invention relates to the field of catches. More specifically, the present invention relates to the field of catches for doors (sliding or hinged), windows, drawers, grilles etc.

Sliding doors, grilles, windows etc. suffer from the problem that they can often be easily forced opened by prising the sliding members, i.e. doors, grilles etc. apart. This problem is also encountered in hinged doors, windows, etc. as these are also prone to opening by prising the catch/lock mechanism open which secures the hinged door.

Previously, security devices have been suggested for sliding grilles etc. which prevent the sliding panels being pulled apart to a certain extent. For example, Australian patent AU-27145/95 discloses a device which has inter-engaging teeth which partially prevent sliding grilles from being prised apart. However, under such a force, these teeth will break rendering the security device useless.

The present invention addresses the above problems and, in a first aspect, provides a catch assembly for securing first and second members,

the assembly comprising first and second catch members attachable to the first and second members respectively, each catch member having a projection portion located on a shaft, the projections of the first and second catch members being engageable with one another when the first and second catch members are in a locked position, the first and second shaft portions being flexible, such that as the members are moved apart or together when the catch members are in the locked position, the shafts flex to keep the projections engaged with one another.

The provision of the flexible shafts allows the catch to withstand a greater force prising the first and second members apart. Generally, the shaft of each catch member flexes such that as the first and second members are moved apart, the shaft flexes away from the member to which it is attached.

As the first and second members are moved, the catch members, or preferably the shafts of the catch members, elastically deform to keep the projections engaged. The shafts of the catch members preferably flex to keep the projections engaged as the first and second members are moved apart or even as they are moved together. The catch members or shafts will deform elastically up to a point, then they will preferably plastically deform. This plastic deformation is used advantageously to provide a secure catch.

Preferably, the catch members or at least the shafts of the catch members will comprise metal or plastics. More preferably, they will comprise at least one of the following UPVC, aluminium, iron or stainless steel. A material with a modulus of preferably at least $62GNm^{-2}$ ($9x10^6$ psi) is required, more preferably at least $103GNm^{-2}$ ($15x10^6$ psi), even more preferably at least $138GNm^{-2}$ ($20x10^6$ psi).

The above materials or materials with the above elastic properties also satisfy the plastic deformation properties preferably required by the present invention. For example, aluminium 6061-T6 has a Young's modulus of $70GNm^{-2}$ (10.2×10^6 psi) ductile Iron is between 170 and $176GNm^{-2} \times 10^6$ psi and stainless steel 18.8 is $190GNm^{-2}$ (27.6×10^6 psi). In general, a force of more than double these values is required to cause plastic deformation.

The shafts flex as the first and second members moved apart or pushed together, the shafts preferably are capable of moving through at least 25° from their rest position as they flex, more preferably, the shafts can move through at least 30° from their rest position.

If the first and second members are being moved apart, for example, if they are prised apart, the separation between the first and second members increases and the shafts flex to maintain the projections in contact. As there is now a larger separation between the first and second members, it is difficult to maintain application of a strong prising force. For example, if the shafts flex by more than 25°, it is very difficult to apply an effective prising force.

Preferably, the shaft is "L" shaped. One end of this shaft is connected to the member and the projection is located at the other end of the shaft i.e. the free end. As the shafts flex, preferably, the angle at the corner of the "L" shape varies, for example it increases if the members are pulled apart. If the first and second members are pushed together, the angle at the corner of "L" should also increase. More preferably, the first and second catch members are positioned so that they can slide easily over one another when the members are in an unlocked position and engage with each other when the members are in a locked position.

Of course, the shaft does not need to be L-shaped, it could be curved.

The members may be provided with a plurality of catches. Preferably, such catches extend along a whole length of the member to strengthen the entire sliding assembly against unauthorised opening of the doors, grille, windows etc. Also, if one of the catches opens, the remaining catches will hold the first and second members together.

The provision of a plurality of catch members provides far greater security. If the members are pulled apart at a certain point such that they plastically deform at that point, the other members which were not prised apart will remain in their rest position. This line of catches where some of the members are permanently plastically deformed and others are not, gives rise to an irregular line of catches (a wave like structure) which prevents opening of the first and second members. It is not possible to bend the catches which have been permanently deformed back into position without bending another

catch out of position. Also, the catch which has deformed will further deform in an attempt to straight it by moving the first and second members.

In the sliding member assembly, one or both of the first and second members may be slidable.

The first and second members to which the catch members are attached can be members which slide relative to one another, for example the first and second members may be sliding doors alternatively, the second member may be a fixed member and the first member may slide relative to the first member, for example, the second member may be a door post, window frame, drawer support etc. and the first member may be a door, sliding window, or drawer respectively.

Thus, in a second aspect, the present invention provides a sliding member assembly comprising first and second members wherein at least one member slides relative to the other member and a catch assembly, the catch assembly comprising first and second catch members attachable to the first and second members respectively, each catch member having a projection portion located on a shaft, the projections of the first and second catch members being engageable with one another when the first and second catch members are in a locked position, the first and second shaft portions being flexible, such that as the members are moved apart or together when the catch members are in the locked position, the shafts flex to keep the projections engaged with one another.

In the case where the two members slide relative to each other, at least one of the members may be substantially planar, at least one of the catch members may be attached to the planar face of one of the members which faces the other of the first and second members.

Also, one of the catch members may be attached to the edge or close to the edge of one of the members.

In a preferred arrangement, a catch member is provided on opposite sides of the first sliding member, each of the catch members of the sliding member being engageable with catch members located on one or two second members.

Alternatively, the catch may be used with hinged or so-called swing doors, windows or the like. In this type of arrangement, the second member is hingeably attached to a fixed member such as a door frame etc. The door/window assembly locks by securing the second member to a first member.

Thus, in a third aspect, the present invention provides a hinged member assembly comprising first and second members, wherein the first member is a hinged member and is capable of being secured in a closed position to the second member, the assembly further comprising a catch assembly for securing the first and second members together, the catch assembly comprising first and second catch members attachable to the first and second members respectively, each catch member having a projection portion located on a shaft, the projections of the first and second catch members being engageable with one another when the first and second catch members are in a locked position, the first and second shaft portions being flexible, such that as the members are moved apart or together when the catch members are in the locked position, the shafts flex to keep the projections engaged with one another. In the hinged member assembly, one or both of the first and second members may be hinged.

The first and second members may be only separated by a small distance when in the locked position. Hence, large instruments cannot be used to prise open the two members. Preferably, the minimum distance between the first and second members is twice the size of the catch members such that the catch members can move over one another in an unlocked position. Preferably, the first and second members will be at least 4mm apart, possibly at least 10mm apart.

Preferably, the arrangement further comprises a lock member which moves the first and second catch members into the locked position.

In the locked position, the projections of the first and second catch members interengage. Thus, in order to lock the catch members, the projections must be brought into contact. The lock member may affect movement of the catch members themselves. Alternatively, it could cause movement of the first and second members as well as the catch members.

As previously mentioned preferably, a plurality of catch members are provided. In this situation, it is preferable if at least one catch is orientated in a first orientation and at least one other catch is oriented in a second orientation.

More preferably, the first orientation is opposite to the second orientation. This has the advantage that regardless of which sides of the catch are prised apart, the plurality of catches will still hold the device together.

Advantageously, there may be a plurality of catches with the first orientation and a plurality of catches with the second orientation, the catches having the first orientation are alternately arranged with the catches having the second orientation.

The catch assembly can be fitted to the first and second members via glue, nails, screws etc. Alternatively, the catch members may be integral with at least one of the first and second members. The catch members could also clip, for example, to an edge of the first and/or second members.

The present invention will now be described with reference to the following preferred embodiment in which:

Figure 1 shows an embodiment of the present invention with a catch in an open position;

Figure 2 shows the embodiment of Figure 1 with the catch in a closed position;

Figure 3 shows the catch of Figures 1 and 2 when the members are prised apart;

Figure 4 shows the catch of Figures 1 to 3 which has been prised open;

Figure 5 shows the catch of figures 1 to 4 which has been squashed;

Figure 6 shows two members which are slidable relative to each other with a plurality of catches in accordance with the present invention;

Figure 7 shows two slidable members with a plurality of catches alternatively arranged in opposite directions;

Figure 8 shows a schematic plan view of the catch shown in Figures 1 to 5 applied to sliding windows;

Figures 9a to 9b show a drawer using the catch of members 1 to 5; and

Figures 10a to 10c show the catch of Figures 1 to 5 applied to a swing door.

Figure 1 shows a catch 1 which is attached to a first member 3 and a second member 5. The second member 5 is slidable in a first sliding direction 7 relative to the first member 3. The catch 1 has a first catch member 9 and a second catch member 11. The first catch member 9 has an L shaped shaft 13 which is integral with the first sliding member (3) at one end 15. A first projection 17 is located at the other end of shaft 13. A first projection 17 is also integral with shaft 13 at its free end.

Similarly, second catch member 11 comprises an L shaped shaft 19 and a second projection 21. The second catch member 11 is similar in construction to the first catch

member 9, but is rotated through 180° to the first catch member 9. The distance (d) between the first 3 and second 5 members is such that the second member 5 can freely slide in the first sliding direction 7 relative to the first member.

In Figure 1, the catch is shown in the unlocked position, i.e. the projection 17, 21 are not interengaged with each other. The catch may be moved into the locked position by lock member 4. In this particular example, lock member 4 acts to pull the first catch 9 towards itself such that the projection 17 and 21 interengage. Alternatively, lock member 4 could work by pushing the elongate part 12 of shaft member 11 away from the lock member 4. This also allows the first and second projections 17 and 21 to engage.

Figure 2 shows the catch member in its locked position. The lock member 4 is not shown here, the separation distance (d) between the first member 3 and the second member 5 is increased such that the first and second projections 17, 21 engage with one another . Inner surfaces 29, 31 of the two projections 17, 21 about one another such that the second member 5 cannot be moved along first sliding direction 7. Hence, the sliding assembly is in a locked position.

Figure 3 shows the arrangement of Figure 2 where the first member 3 and the second member 5 are prised apart to extend the separation distance (d). In this forced position, the angle 23 of the L shaped first and second shafts 13, 19 extends to greater than 90°. Also, the outside angle 25, 27 at which the first 13 and the second 19 shafts respectively meet the first 3 and second 5 members also extends to more than 90°. In this strained position, the abutting surfaces 29, 31 of the projections 17, 21 still engage with each other. Hence, the catch members 9, 11 still remain locked in the position holding the sliding assembly together.

Figure 4 shows the catch where the force applied to the catch members has exceeded the plastic deformation limit and the catch members have permanently deformed. This permanent deformation of the catch members also prevents the door from being open.

As has been previously described, preferably, the doors have been provided with a plurality of catches. Only the catches at the point where the force is applied will deform. Therefore, only a small part of the door will have catches which have plastically deformed. This deformation in just a small part of the door also causes the door to be prevented from opening.

Figure 5 shows a further safety feature of the catch. In this case, a force has been applied at an opposing end of the sliding members to that where the catches are. This causes the sliding members 3 and 5 to be pushed together. The catch members 9 and 11 are pushed together and plastically deform, here, the deformation is seen to occur in the shorter parts of the L-shaped shafts 9a and 11a and deformed in preference to the longer parts of the shafts 9b and 11b.

It will be preferred for the doors to be provided with a plurality of catches of the type shown in Figures 1 to 5. This is schematically shown in Figure 6. Here, only a part of the L section shaft 13, 19 is shown. If one of the catch member opens, the other catch members should remain shut so preventing the members 3, 5 from being prised apart.

It will be appreciated that there are preferential directions for providing the prising force. Figure 7 shows an arrangement wherein the catches 1 are alternately arranged such that the middle catch 41 is oppositely orientated with respect to adjacent catches 43, 45. Middle catch 41 is a mirror image through the centre of the catch 1 about the abutting surfaces 29, 31. This catch provides a very strong lock as there is no single preferential direction for applying prising force for all of the catches.

Figure 8 shows a sliding window arrangement. Window panes 101 and 103 can slide in directions 105 and 107. The window panes are supported by window frame 109. The window is shut when the window panes 105 and 107 are positioned so that they occupy the whole of the area defined by window frame 109. The furthest end 111, 113 of window panes 103, 101 from the window frame 109 when the window is in the closed position each have a catch member 115, 117 of the type described with reference to

Figures 1 to 5. Ideally, there is a plurality of catch members. However, for simplicity only one catch member is shown here. The window locks by moving the relative position of catch members 115, 117 into the locked position (Figure 2) such that the projection (not shown) on the catch members 115, 117 are interengaged.

If a trespasser attempts to get into the windows by prising open the furthest points of the panes 111, 113, then the catch members 115, 117 flex apart in the manner shown in Figure 3. However, if a force is applied where the window pane meets the frame 109, then this causes the catch members 115, 117 to be pushed together in the manner shown in Figure 5.

Figure 9 shows the catch of the present invention applied to a drawer. The drawer 121 is slidable relative to a housing 123, for example, a cabinet etc. The housing has drawer supports 125 and 127, a first catch member is located on both of the supports 125, 127. However, for simplicity, only the interaction of the drawer with one of the catch members will be described. The drawer 121 is provided with a catch member 129 which is intended to interlock with catch member 131 provided on support 125. The catch member 129 is provided on the side of the drawer 121 close to the front end of the drawer. The front end of the drawer 121 is defined as the end of the drawer which is visible when the drawer is shut. To shut the drawer, the drawer 121 is pushed backwards into the housing 123. When the drawer 121 is pushed into the closed position, the catch members 129 and 131 interengage on both sides of the drawer. Thus preventing removal of the drawer.

Figure 9b shows the drawer in the closed position within the housing 123. The catch can be configured so that the projections 129 and 131 automatically engage when the drawer 121 is pushed into position. Alternatively, a lock member or some other lock mechanism may be provided so that the catch members 129 and 131 only interengage when the lock is activated.

In Figure 9c, a screwdriver or other such implement is inserted into the catch mechanism to try to force open the drawer. The screwdriver 135 causes the right-hand catch members 131 and 129 to interengage more strongly. The drawer is pushed in the direction of the left-hand support 125. The catch members 129 and 131 on the right-hand side will interengage more strongly. As the drawer is pushed towards support 125, the left-hand catch members 129 and 131 are also interengaged more strongly. If the force applied to the drawer by screwdriver 135 is strong enough at least one of the catch members 129, 131 will plastically deform.

Figures 10a to 10c show the present invention applied to a hinged door. Figure 10a shows a hinged door 201 which is hingeably connected to fixed support 203. The door is closed when it is in line with fixed supports 205. The free end of the door 201, i.e. the end of the door which is opposite to a hinge 207 is provided with a first catch member 209. A second catch member 211 is provided on support 205.

Figure 10b shows the door when it is shut. The catch members 209 and 211 interlock to cause the door 201 to be locked into position in line with support 205 and 203.

The catch members 209 and 211 may interlock as the door is put into the closed position. Alternatively, a further lock may be provided to cause projections on catch members 209 and 211 to interengage. A screwdriver 213 can be used to push members 209 and 211 into the locked position. The screwdriver 213 cannot be used to prise open the catch members. As it will only force them more into engagement. Eventually, the catch members will start to plastically deform.

CLAIMS:

1. A catch assembly for securing first and second members,

the assembly comprising first and second catch members attachable to the first and second members respectively, each catch member having a projection portion located on a shaft, the projections of the first and second catch members being engageable with one another when the first and second catch members are in a locked position, the first and second shaft portions being flexible, such that as the members are moved apart or together when the catch members are in the locked position, the shafts flex to keep the projections engaged with one another.

2. A catch assembly according to claim 1, wherein at least a part of one of the catch members is capable of permanently deforming as the first and second members are moved.

3. A catch assembly according to any preceding claim, wherein the shaft of each catch member flexes away from the member to which is attached as the members are moved apart.

4. A catch assembly according to any preceding claim, wherein the catch members comprise a material which has a Young's Modulus of more than $62GNm^{-2}$ ($9x10^6$ psi).

5. A catch assembly according to claim 4, wherein the catch members comprise a material which has a Young's modulus of at least $103GNm^{-2}$ ($15x10^6$ psi).

6. A catch assembly according to any preceding claim, wherein the catch members comprise metal or plastics.

7. A catch assembly according to claim 6, wherein the catch members comprise at least one of UPVC, aluminium, iron or stainless steel.

8. A catch assembly according to any preceding claim, wherein the shaft moves angularly as it flexes.

9. A catch assembly according to claim 8, wherein the shaft is capable of moving through at least 25° from its rest position during flexing.

10. A catch assembly according to any preceding claim, wherein the shaft of the catch members is "L" shaped with one end of the L being attached to the respective member and the projection being attached to the other end of the shaft.

11. A catch assembly according to claim 10, wherein the shaft flexes such that the angle at the corner of the L is varied as the members are moved apart or together.

12. A catch assembly according to any preceding claim, having a plurality of said catches.

13. A catch assembly according to claim 12, wherein the plurality of catches are arranged along a whole length of at least one of the first and second members.

14. A catch assembly according to any of claims 12 to 13, wherein at least one catch is orientated in a first orientation, and at least one other catch is oriented in a second orientation.

15. A catch assembly according to claim 14, wherein the first orientation is substantially opposite to the second orientation.

16. A catch assembly according to either of claims 14 or 15, wherein a plurality of catches are oriented in a first orientation and a plurality of catches are oriented in a second orientation wherein the catches of the first orientation are alternately arranged with the catches of the second orientation.

17. A catch assembly according to any preceding claim, further comprising a lock member wherein the lock member is configured to move the first and second catch members into a locked position.

18. A catch assembly according to claim 17, wherein movement of the lock affects movement of a catch member.

19. A catch assembly according to claim 17, wherein movement of the lock affects movement of a member and a catch member.

20. A sliding member assembly, comprising first and second members wherein at least one member slides relative to the other member and a catch assembly according to any of claims 1 to 19.

21. A sliding member according to claim 20, comprising at least two first catch members at least wherein a first catch member being located on opposing sides of the first member.

22. A sliding member assembly according to either of claims 20 or 21, wherein the first member is a sliding door, sliding window, sliding grille or a drawer.

23. A hinged member assembly, comprising first and second members wherein the first member is a hinged member and is capable of being secured in a closed position to the second member, the assembly further comprising a catch assembly for securing the first and second members together, wherein the catch assembly is a catch assembly according to any of claims 1 to 19.

24. A hinged member assembly according to claim 23, wherein the first member is a hinged door, hinged window or hinged grille.

25. A catch assembly as substantially hereinbefore described with reference to any of the accompanying drawings.

26. A sliding member assembly as substantially hereinbefore described with reference to any of Figures 1 to 9.

27. A hinged member assembly as substantially hereinbefore described with reference to Figure 10.

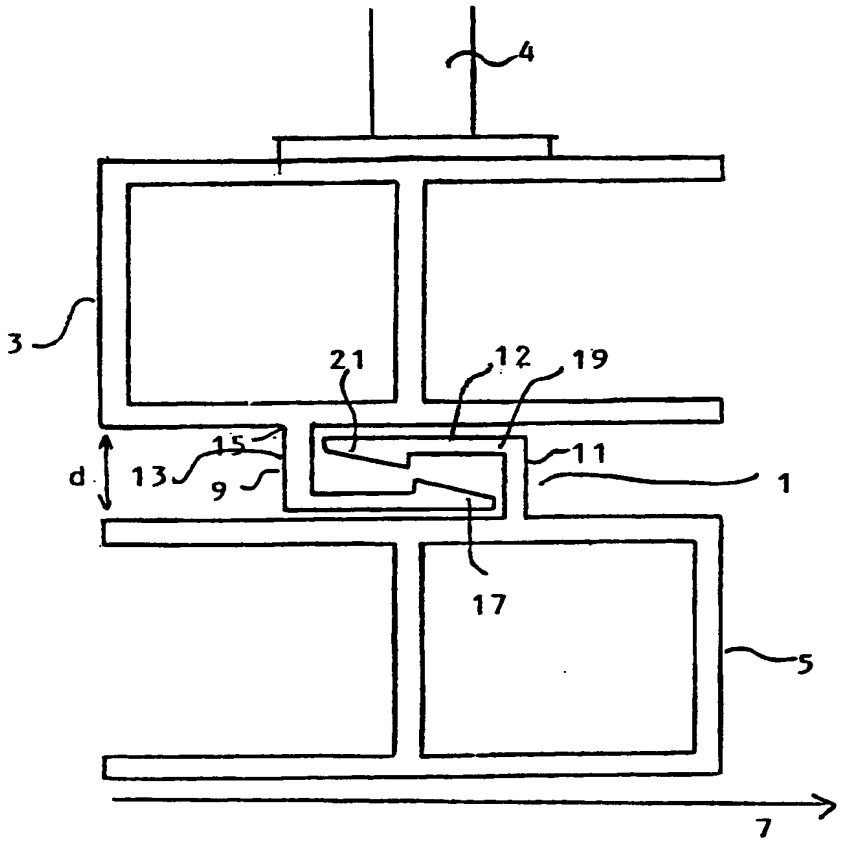


FIG. 1

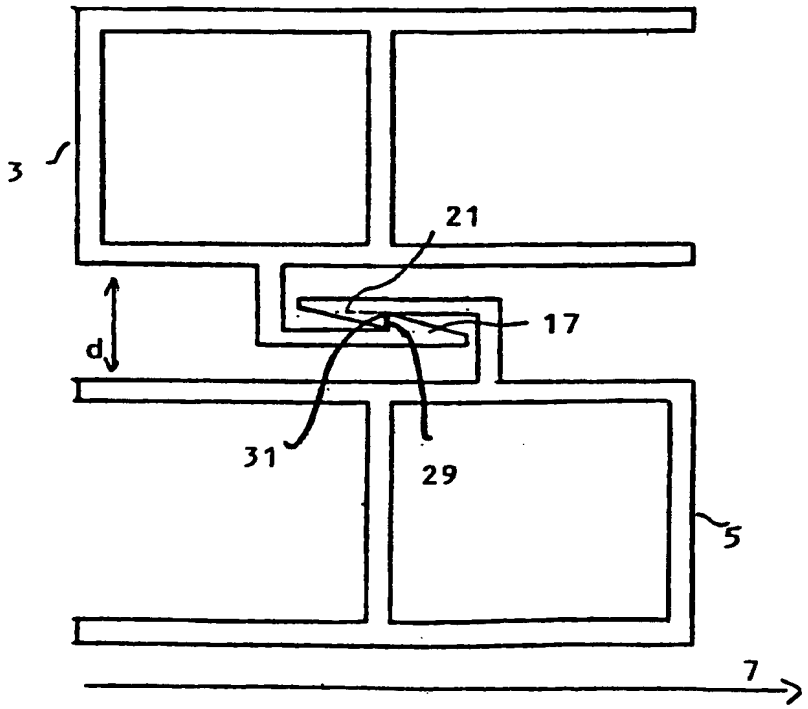


FIG. 2

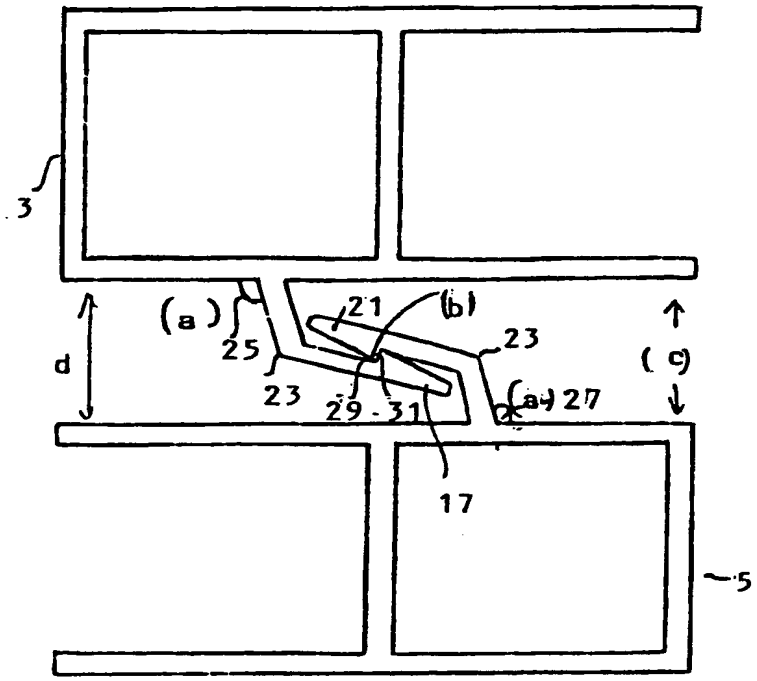


FIG. 3

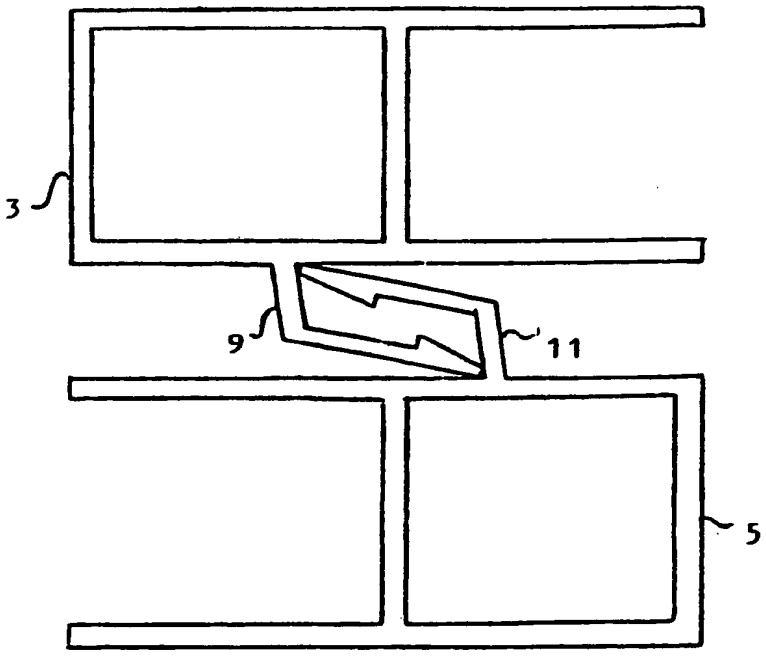


FIG. 4

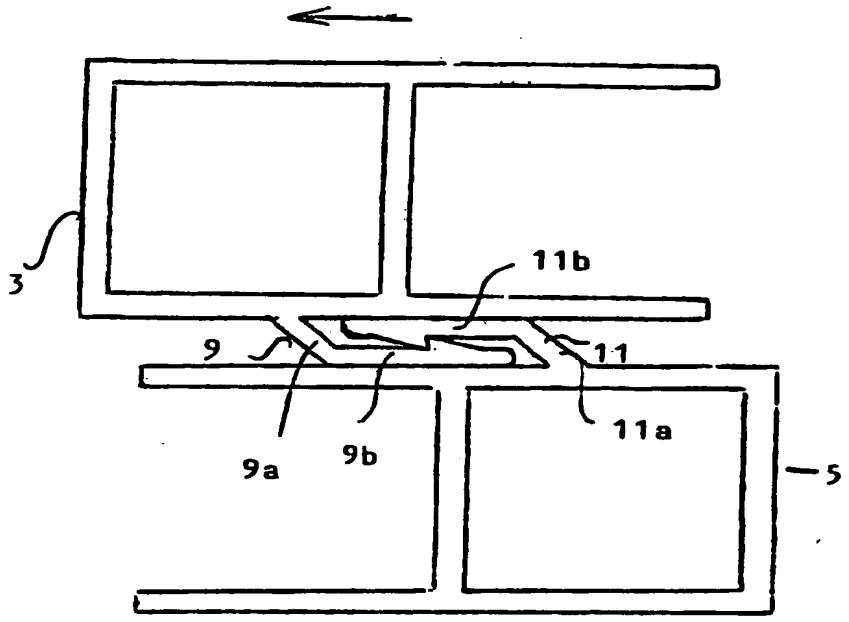


FIG. 5

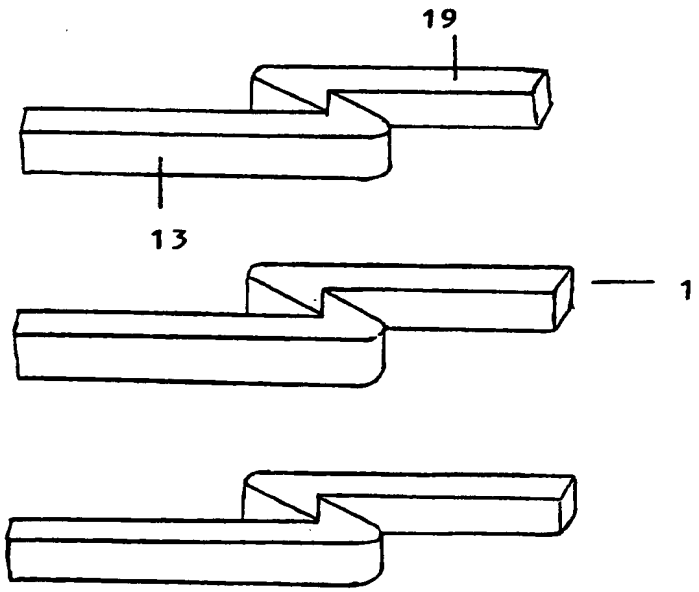


FIG. 6

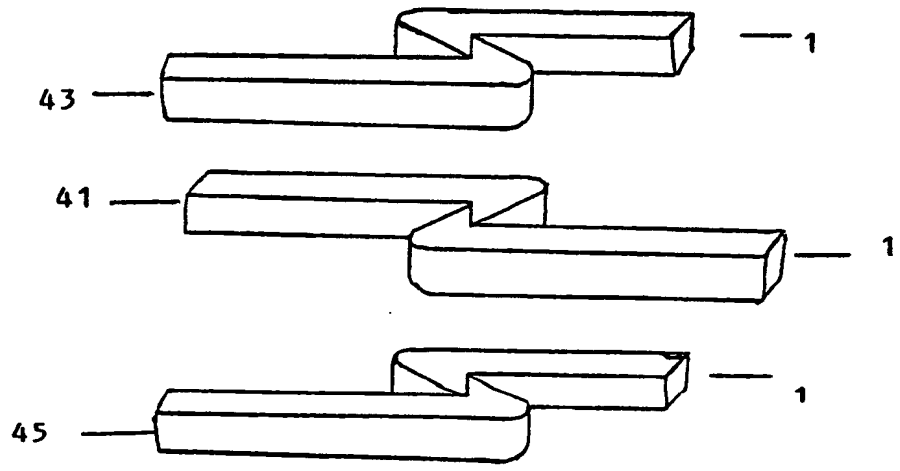


FIG. 7

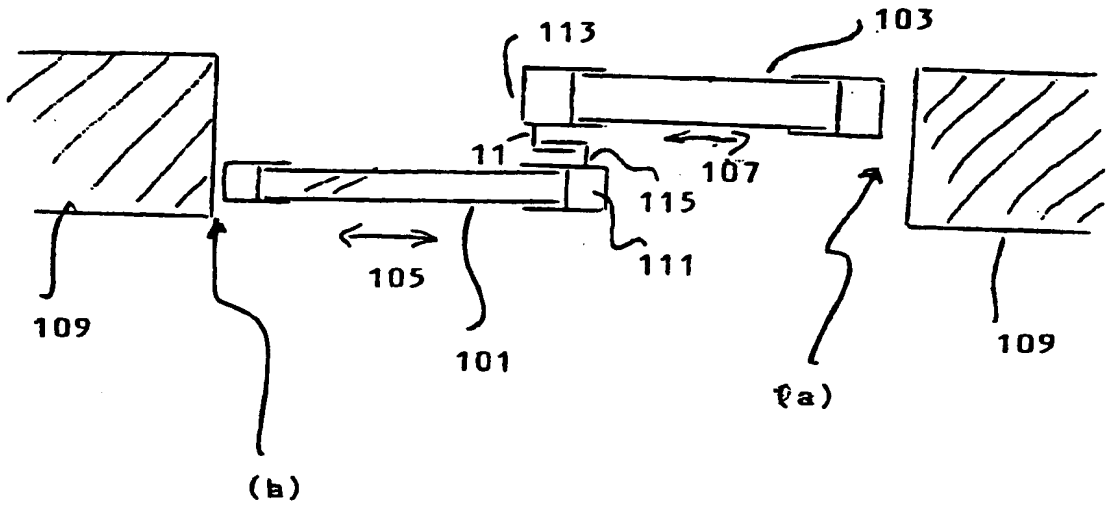
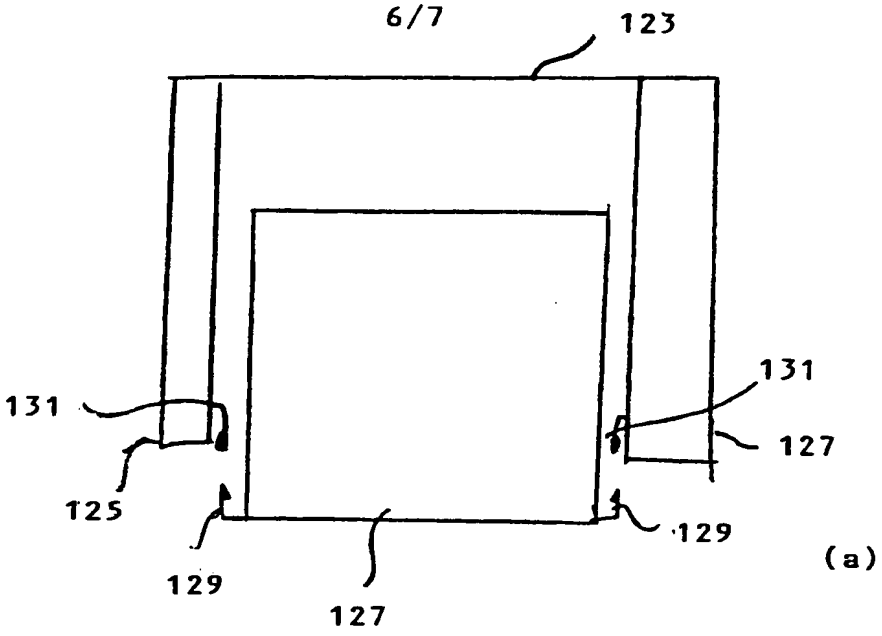
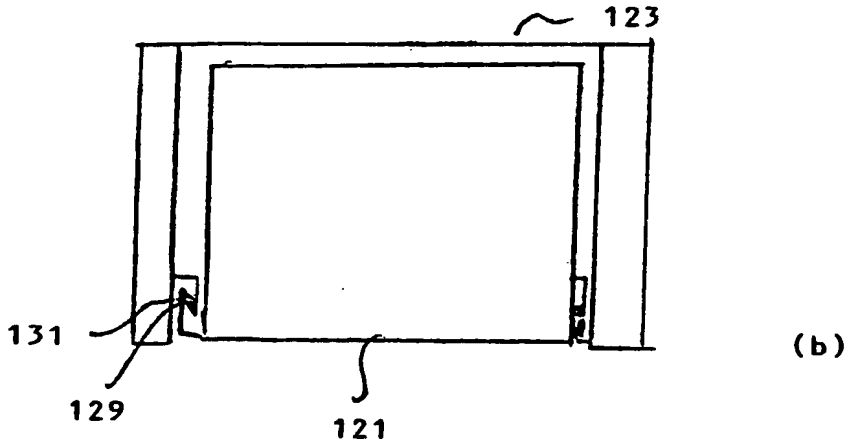


FIG. 8


123
131
131
127
125
129
129
127
(a)


123
131
129
121
(b)

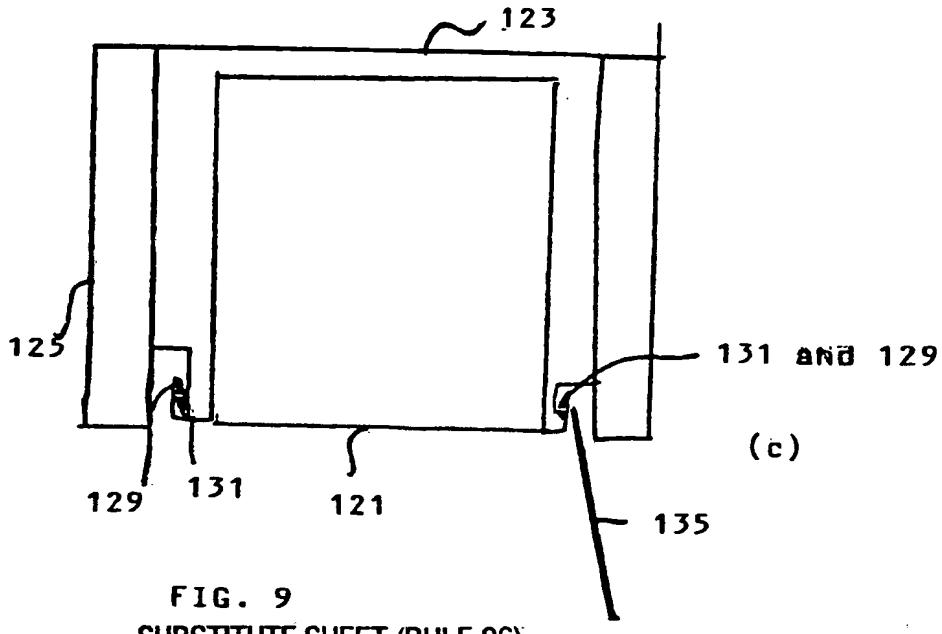
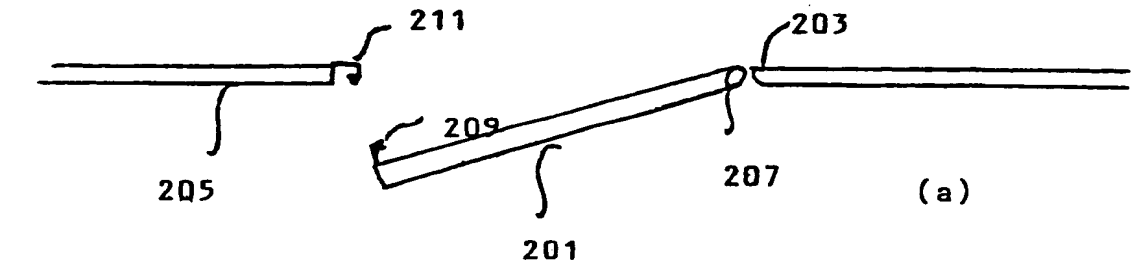
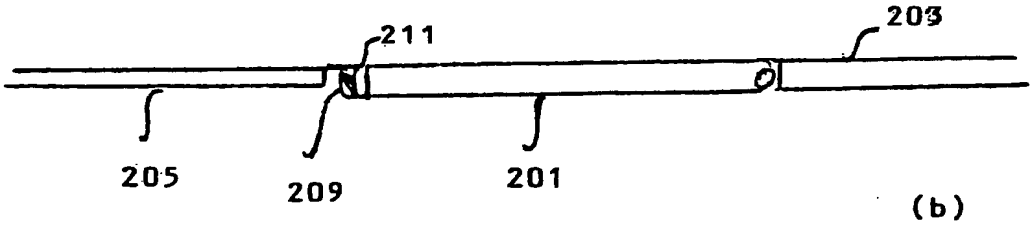

123
125
131 AND 129
(c)
129
131
121
135

FIG. 9





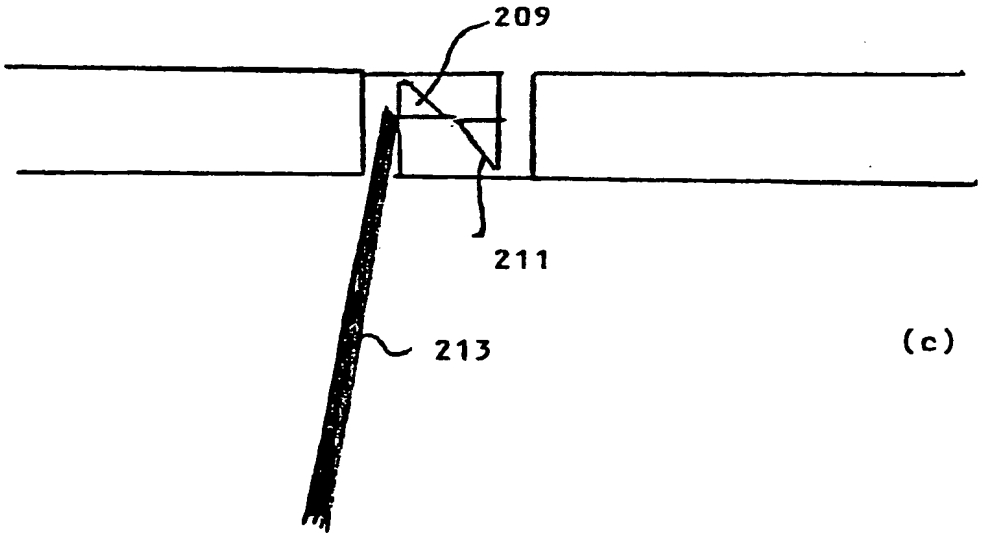


FIG. 10

INTERNATIONAL SEARCH REPORT

Inter[redacted]pplication No
PCT/SG 00/00122

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 E05C19/06 E05B65/46 E06B5/11 E06B3/46

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 E05C E05B E06B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	H. NOMURA: "Latch Mechanism Comprising Plastic Parts" IBM TECHNICAL DISCLOSURE BULLETIN, vol. 26, no. 4, 1 September 1983 (1983-09-01), pages 2041-2042, XP002152916 New York, US	1,2,4-8, 10,11, 25,26
Y	the whole document	12-15, 17,18, 20,22

Y	US 3 160 431 A (RALPH F. ANDERSON; CHARLES G. HALLGREN) 8 December 1964 (1964-12-08)	12-15
A	figures 1-17	16,20, 22-24

	-/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 November 2000	30/11/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	PEREZ MENDEZ, J

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Inter[redacted]plication No
PCT/SG 00/00122

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
Y	CH 649 602 A (EGOKIEFER AG) 31 May 1985 (1985-05-31)	17,18
A	the whole document	1,4-11
Y	US 5 641 186 A (ROSS DAMIEN) 24 June 1997 (1997-06-24) figures 1-6	20,22
X	EP 0 508 750 A (THE KIDDY GROUP PLC) 14 October 1992 (1992-10-14) column 4, line 30 - line 43; figures 1-3	1,2,4-8, 23,34
X	US 4 725 084 A (FRANK CATRICOLA) 16 February 1988 (1988-02-16)	1-9, 23-25,27
A	column 2, line 61 -column 4, line 37; figures 1-3	12,13
A	DE 84 30 945 U (RITTER STARKSTROMTECHNIK GMBH & CO) 14 September 1989 (1989-09-14) page 4, paragraph 3 -page 5, paragraph 4; figures 1-5	12,13,19
A	FR 2 414 108 A (ROUTCHENKO MICHEL) 3 August 1979 (1979-08-03) figures 1-14	1,17,18, 20-23

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

[redacted]ormatio[redacted]tent family members

Intern[redacted]pplication No
PCT/SG 00/00122

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3160431 A	08-12-1964	NONE	
CH 649602 A	31-05-1985	NONE	
US 5641186 A	24-06-1997	CA 2134829 A,C	03-05-1995
EP 0508750 A	14-10-1992	GB 2254647 A	14-10-1992
US 4725084 A	16-02-1988	NONE	
DE 8430945 U	14-09-1989	NONE	
FR 2414108 A	03-08-1979	NONE	